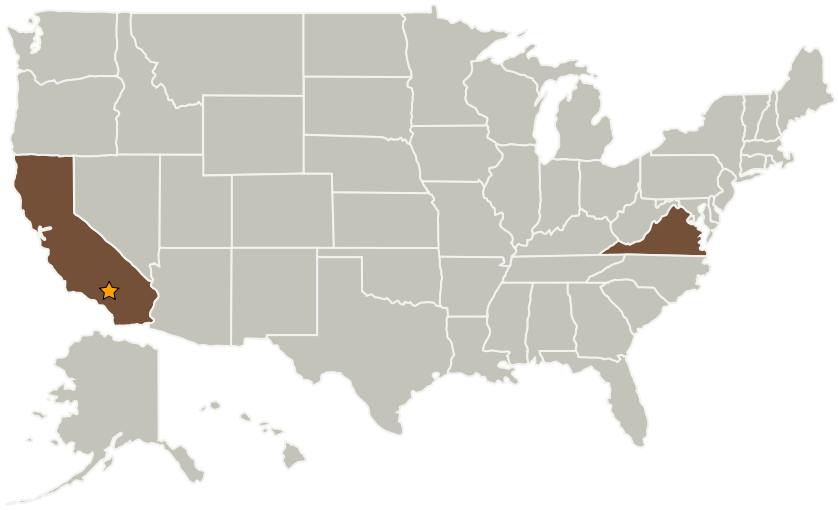
Transonic Flight Smart Sensor Suite, Phase I

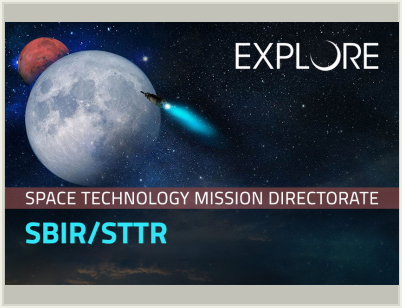
Completed Technology Project (2005 - 2006)

Project Introduction

Fiber optic sensors are rapidly emerging to replace conventional electrical-based sensor instrumentation in specific applications where small size, low mass, multiplexing capability, and high temperature resistance is a requirement. The advantages offered by state-of-the-art fiber optic sensors are particularly important for flight testing applications where the extremely low-profile geometry of a hair-thin Fiber optic sensor permits precise measurements of pressure, temperature and skin friction with minimal intrusion into the flow field. Luna innovations propose the design of a miniaturized, co-located temperature, pressure and skin friction sensor for point distributed transonic flow measurements during aircraft testing. Luna will also work on demodulation hardware and algorithms to improve output accuracy and reliability in a flight environment. During Phase I, Luna proposes to leverage previous experience in the development of combined pressure, temperature and skin friction sensors previously developed and investigate the feasibility of miniaturizing and ruggedizing these transducer assemblies to make an integrated sensor package that is simple to install, cost effective and is compatible with the harsh aircraft environment.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Armstrong Flight Research Center (AFRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Armstrong Flight Research Center(AFRC)	Lead Organization	NASA Center	Edwards, California
Luna Innovations, Inc.	Supporting Organization	Industry	Roanoke, Virginia

Primary U.S. Work Locations	
California	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.3 In-Situ Instruments and Sensors
    - TX08.3.4 Environment Sensors